

# Microcosm-III

CIHR Institute of Infection and Immunity

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## Message from the Scientific Director

One of the key roles of the Institute of Infection and Immunity is to encourage interaction and sharing of knowledge among researchers in universities, hospitals, federal and provincial agencies and departments, the private sector and other institutions. These interactions help in the development of national and international research agendas, eliminate redundancy and speed the development of new methods for the prevention, diagnosis and treatment of disease. The Institute has formed, led and contributed to many effective partnerships since its inception in 2000. Examples of new and continuing partnerships are highlighted in this newsletter.

The outbreaks and deaths caused by a more virulent strain of *C. difficile* in Quebec required immediate action from health care professionals and researchers. To identify critical research priorities, the Institute co-hosted, with the University of Manitoba, a national symposium on *C. difficile* in September 2004. In addition, the Institute recently joined a partnership led by the Fonds de la recherche en santé du Québec (FRSQ) to fund research to understand the epidemiology of the *C. difficile* infection and to examine bacterial virulence factors and their clinical effects. This partnership received financial support from the Governing Council of CIHR and is an excellent example of how funding agencies can facilitate synergistic collaborations among clinical, epidemiological and basic science researchers with the overall goal of preventing infection and death.

The Canadian Vaccine Initiative (CVI) is an important partnership that the Institute is developing in collaboration with the Public Health Agency of Canada (PHAC). Canada

has considerable vaccine expertise, as demonstrated by organizations such as the Canadian Network for Vaccines and Immunotherapeutics (CANVAC), British Columbia Centre for Disease Control (BCCDC), PHAC, Vaccine and Infectious Disease Organization (VIDO), Canadian Association of Immunization Research and Evaluation (CAIRE) and companies in the private sector, but there is a need for these organizations to work together. The goal of CVI is to support these relationships in order to optimize vaccine research, develop and evaluate novel methods for vaccination and allow Canada to develop a national vaccine research strategy which will have international implications.

Partnership development is a core activity of the Institute of Infection and Immunity; whether established to sustain an ongoing research initiative or to launch a single funding opportunity, partnerships such as the ones described in this newsletter help generate creative ways to maximize the CIHR investment in health research.

In June 2005, the Bill and Melinda Gates Foundation announced the successful applicants to its "Grand Challenges in Global Health" initiative. The overall objective is to achieve scientific breakthroughs against diseases that kill millions of people each year in the world's poorest countries. Forty-three grants totaling \$436.6 million (U.S.) were awarded to scientists in 33 countries, including three groups in Canada. Congratulations to lead investigators Drs. Lorne Babik, Brett Finlay and Frank Plummer for their successful applications (see table). All three are current members of our Institute Advisory Board. The

*Continued on page 2*



Canadian Institutes  
of Health Research

Instituts de recherche  
en santé du Canada

Canada

SD's message (*continued*)

Institute is proud of the proactive role it played in helping several Canadian teams compete for these grants by providing application development grants. In this "behind-the-scenes" partnership, the Institute, together with the Institute of Population and Public Health and the Institute of Human Development, Child and Youth Health, awarded funds to 13 research teams. In a partnership with the Gates Foundation, CIHR has committed CAN\$5.6 million over five years to the successful Canadian applicants, bringing their total budget to approximately CAN\$30 million. The results of this research hold great promise to dramatically improve global health.

Bhagirath Singh, PhD  
Scientific Director  
CIHR Institute of Infection and Immunity

## Grand Challenges in Global Health

Successful Canadian Applicants

Lead Investigator	Title
Dr. Lorne Babuik University of Saskatchewan	Linking Innate and Specific Immunity to Develop Single-Dose Vaccines for Neonates
Dr. B. Brett Finlay University of British Columbia	Novel Therapeutics That Boost Innate Immunity to Treat Infectious Diseases
Dr. Frank Plummer University of Manitoba	Comprehensive Studies of Mechanisms of HIV Resistance in Highly Exposed Uninfected Women

Institute of Infection and Immunity –  
Who we are

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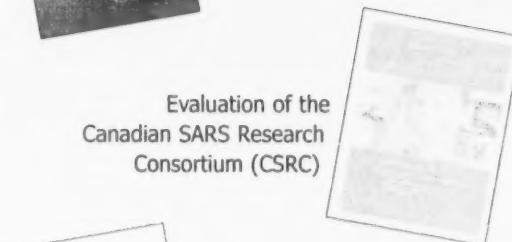
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## III Publications



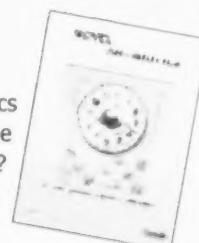
Canadian SARS Research Consortium Report 2003-2005:  
A Framework for a Canadian Rapid Research Response



Evaluation of the Canadian SARS Research Consortium (CSRC)



Institute of Infection and Immunity Annual Report 2003-2004



Novel Alternatives to Antibiotics  
Workshop Report: Is Time Running Out For Antibiotics?

These reports are available on our website:  
[www.cihr-irsc.gc.ca/e/13540.html](http://www.cihr-irsc.gc.ca/e/13540.html)

# Clostridium difficile

## Background Information

*Clostridium difficile* (*C. difficile*) is an anaerobic, gram positive, spore-forming bacterium, which may form part of the normal intestinal flora in the very young. For many years, *C. difficile* has been recognized as a major cause of pseudomembranous colitis and antibiotic-associated diarrhea, although until recently infection rarely resulted in severe morbidity or death. The increasingly widespread use of multiple broad-spectrum antibiotics, combined with the increased age and fragility of hospital patient populations, have provided the ideal environment for the selection of *C. difficile*, a bacterium resistant to almost all of the commonly used antibiotics. As a result, the incidence of *C. difficile* outbreaks has become more frequent and the infections more severe. The recent emergence of a new, more virulent strain of *C. difficile* in Quebec and Alberta and the resulting deaths have alerted the hospital community to a potential crisis, which could very easily become nationwide. In the last two years, the rate of *C. difficile* infection in Quebec health care institutions has increased four



Artist's interpretation - not actual picture of *C. difficile*

to five times. Officially, 109 patients in the Montreal area alone died from *C. difficile* in the first half of 2004, more than twice the total Canadian death rate from the SARS outbreak in 2003. Some estimates put last year's death toll from *C. difficile* in Quebec at more than 600. This is a health care crisis that requires an immediate response if the problem is to be controlled and a national emergency be avoided.

*C. difficile* infection commonly occurs when the normal intestinal flora is altered, most often by the prolonged use of antibiotics. The use of a class of drugs called proton pump inhibitors, which prevents gastric acid secretion, has also been shown to increase the risk of *C. difficile* infection. In the majority of cases, the patients most severely affected are the elderly, patients with impaired immune systems and those suffering from one or more severe illnesses for which they have been treated by prolonged use of antibiotics. The multi-drug

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## Institute Advisory Board Members 2005-2006

The Institute is pleased to welcome three new members to our Institute Advisory Board:

Dr. Luis Barreto

Dr. Noel Rose

Dr. David Speert

**Dr. Lorne A. Babiuk** University of Saskatchewan (Chair)

**Dr. Luis Barreto**, sanofi pasteur

**Dr. Joe Cox** McGill University

**Dr. Warren Hill** BC Centre for Disease Control

**Dr. James Lavery** University of Toronto/St. Michael's Hospital

**Dr. Mark Loeb** McMaster University

**Dr. Joaquin Madrenas** Robarts Research Institute/University of Western Ontario

**Ms. Mary Catharine McDonnell** South Shore Health, Lunenburg, NS

The Institute would like to thank retiring board members Drs. Chris Bleackley, B. Brett Finlay and William E. Paul for their dedication and contributions. The full Institute Advisory Board is:

**Dr. Allison McGeer** Mount Sinai Hospital

**Dr. Marc Ouellette** Laval University

**Dr. Kevork Peltekian** Dalhousie University

**Dr. Frank Plummer** Public Health Agency of Canada

**Dr. Chris Power** University of Calgary

**Dr. Noel Rose** The Johns Hopkins University School of Medicine

**Dr. David Speert** University of British Columbia

**Dr. Tania Watts** University of Toronto (Vice-Chair)

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### Clostridium difficile (*continued*)

resistance of *C. difficile* makes treatment difficult and, even if successful, 25-30% of patients with *C. difficile* infection experience multiple relapses. In the most severe infections, patients can progress from mild diarrhea to death within a matter of hours. Even more alarming are recent reports of severe *C. difficile* infection in young, previously healthy individuals with no history of antibiotic use.

Inadequate infection-control practices in many hospitals and chronic-care facilities are central to the recent *C. difficile* crisis. The advent of the antibiotic era resulted in a dramatic decline in infection-control practices. Patients crowded into multi-bed rooms with shared bathroom facilities, inadequate housekeeping procedures and poor hand hygiene have all contributed to the rise in the incidence and transmission of hospital-acquired infections. *C. difficile* is readily transmissible by hand-to-hand contact and the spores can survive for up to seven weeks in the environment.

Some of the unanswered questions surrounding the Quebec outbreaks of *C. difficile* infection include the interactions between environmental and bacteriologic factors, the relative virulence of circulating strains of *C. difficile* and their prevalence in the community, the role of the host immune response and the antibiotic-susceptibility profile of different bacterial strains.

### III Response

In November 2004, the Institute of Infection and Immunity (III) co-hosted a national symposium on *C. difficile* with the

University of Manitoba, at which many of the key research questions were identified. Some of these research questions will be addressed in a CIHR-funded grant led by Drs. Alison McGeer and Louis Valiquette entitled, "Derivation of clinical prediction rules to identify patients with complicated outcomes after diagnosis of clostridium difficile associated diarrhea".

The Institute is also a partner on the new Partnerships in Health System Improvements program, launched by CIHR in September 2004. This program is designed to support health services research with a strong emphasis on knowledge translation. Eligible applicants are required to have the active support of health care administrators and policy makers to ensure rapid uptake of knowledge generated through research. Several applications were submitted in response to the III call for applications related to infection control, including those specifically related to the control of *C. difficile* infections. Funding announcements are posted on our web site: [www.cihr-irsc.gc.ca/e/13533.html](http://www.cihr-irsc.gc.ca/e/13533.html)

Recently, III agreed to join a partnership led by the FRSQ. Recognizing the urgency of the Quebec situation, FRSQ has recruited a team of more than 18 outstanding researchers to mount an interdisciplinary research effort that will integrate clinical and molecular epidemiology and basic science. This team has identified two distinct but complementary themes: epidemiology and disease control; and molecular biology and clinical impact of virulence factors. III was successful in obtaining a financial commitment of \$200,000 over two years from the CIHR Governing Council to support this partnership.

## III New Investigator Forum

The Institute hosted its first New Investigator Forum in King City, Ontario, on April 15-17, 2005. The Forum was attended by 99 new investigators in the first to fifth year of their academic research appointments. The participants brought with them a diversity of knowledge and perspectives in the fields of immunology, microbiology, biochemistry, cell biology, virology, transplantation, asthma, allergy, innate immunity, public health and vaccine development.

The purpose of the Forum was to provide an opportunity for new investigators in the disciplines and themes of infection and immunity to interact with their peers across Canada, to develop skills relating to planning and supporting a research career and to receive information about potential opportunities for strategic programs relating to new investigators.

The Forum included scientific presentations from eminent guest speakers Drs. Brett Finlay, Sergio Grinstein and Catherine Hankins and a presentation about CIHR programs from Dr. Mark Bisby, Vice President, Research. Jay Ingram of the Discovery Channel, the featured dinner speaker, spoke

on the topic of "Communicating your Science". The Forum also featured workshops on interdisciplinary research collaboration, time/career management, grant writing and peer review, research ethics and building research teams; these were facilitated by senior investigators and provided essential information and advice for the career development of new investigators. Evenings concluded with poster sessions where participants showcased their research programs. This provided an excellent opportunity for participants and speakers to interact, learn, share and network with their peers.

Overall, the first Forum was a resounding success. Participants recommended that the Forum be repeated and feedback from their evaluation will be used to improve future programs.

The Institute is grateful to the members of the organizing committee, chaired by Drs. Warren Hill and Joe Cox, the invited speakers, sponsors and the Institute staff for their contributions to the success of this event.

## Novel Alternatives to Antibiotics Workshop

In 2004, Dr. Brett Finlay, a member of the III Institute Advisory Board, identified a need for research into novel alternatives to antibiotics. His premise was threefold: that anti-microbial resistance is always generated by the use of traditional antibiotics in combating infection, the interest of the private sector in developing new antibiotic drugs has declined, and academia does not have the financial resources to take potential new discoveries to market. Researchers known for both their research expertise and ability to think "outside of the box" participated in an informal and interactive workshop in Vancouver on March 10-11, 2005.



*As one of Canada's leading experts in the field of antibiotic resistance Dr. Julian Davies was well-placed to give participants a comprehensive overview of the current situation in Canada and abroad, based on his many years of experience dating back almost to the original discovery of penicillin in the 1940's.*

The workshop combined an overview of antibiotic resistance with free-ranging discussions on potential alternatives to antibiotics. The criteria used to identify topics included the originality of the approach, the feasibility of mounting a research initiative based on available research strengths, the potential for rapid uptake of results (knowledge translation) and cost.

When viewed from the perspective of responsiveness to the goals of the workshop and 'readiness' for immediate development of a research initiative, three themes emerged as being of high priority:

**Immune Systems** - Modulation of the host immune response, either through vaccine delivery (therapeutic and preventive) or other mechanisms to increase innate immunity, holds considerable promise as a means to fight bacterial infection. A team approach was recommended to combine the strong Canadian research expertise in immunology and microbiology.

**Phage Therapy** - Although there is some phage therapy research expertise in the Canadian agriculture and biotechnology sectors, there is little academic research capacity in Canada for phage therapy in the health sector. Despite potential regulatory problems, particularly with phage cocktails, phage therapy offers an innovative approach, ideally suited to proof-of-concept studies. Partnership development, both in Canada (with existing biotechnology companies and the agriculture sector) and internationally, will be key in developing a strong research agenda.

**Physical Systems/Biomaterials** - There is enormous potential for partnership between the private sector and health sector and good opportunities for new product development and commercialization. This was considered an excellent area for innovative partnerships among CIHR, the Natural Sciences and Engineering Research Council (NSERC) and the National Research Council of Canada (NRC).

It was recommended that a Request for Applications (RFA) be developed by III and partners and that the eligible research areas include all three themes and topics. In addition, applicants should be required to clearly identify the innovative components of their research project, the contribution their results will make in reducing the problem of antibiotic resistance, expected milestones and an explanation of the process by which research findings will be translated into clinical practice. It was suggested that several different funding models should be made available, including short-term programs, such as pilot projects and proof-of-principle studies, and longer-term programs, such as small team grants, randomized control trials and operating grants. The Institute plans to launch an RFA based on these recommendations.

Detailed information on the workshop can be found on the Institute website: [www.cihr-irsc.gc.ca/e/13540.html](http://www.cihr-irsc.gc.ca/e/13540.html)



*Dr. Davies' talk was followed by a lively question and answer period that covered many areas of antibiotic resistance, from both a scientific and philosophical perspective and addressed some of the problems encountered with new drug discovery and regulatory issues.*

## HIV/AIDS Research Initiatives

### III – A Partner in the Federal Initiative to Address HIV/AIDS in Canada

The Federal Initiative to Address HIV/AIDS in Canada reaffirms the Government of Canada's commitment to fight the HIV/AIDS epidemic both in Canada and globally.

The goals of the Federal Initiative are to:

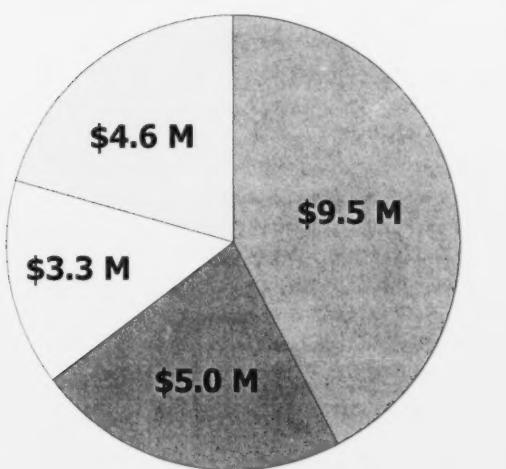
- Prevent the acquisition and transmission of new infections
- Slow the progression of the disease and improve quality of life
- Reduce the social and economic impact of HIV/AIDS
- Contribute to the global effort to reduce the spread of HIV and mitigate the impact of the disease



For more information on the Federal Initiative to Address HIV/AIDS in Canada see the PHAC website:  
[www.phac-aspc.gc.ca/aids-sida/hiv\\_aids/federal\\_initiative/initiative/index.html](http://www.phac-aspc.gc.ca/aids-sida/hiv_aids/federal_initiative/initiative/index.html)

As one of the partners in this initiative, CIHR sets priorities for HIV/AIDS research, funds meritorious research grants and research personnel awards addressing the entire spectrum of HIV/AIDS research and administers the HIV/AIDS Research Program. There are four distinct funding programs – biomedical/clinical research, health services and population health research, Canadian HIV Trials Network and the community-based research program – each with a dedicated budget to support research and capacity-building initiatives. Through the Federal Initiative, the amount available for HIV/AIDS research funding streams (Fig. 1) will reach \$22.6 M by 2008-09. In addition to supporting researchers through the open competitions, strategic initiatives will increase the response to emerging issues and allow greater focus on key research areas.

**Fig. 1 – Distribution of Federal Initiative Research Funds Administered by CIHR – 2008-09**



#### Community-Based Research Program

Following a successful transfer from Health Canada, the first Request for Applications for the Community-Based Research (CBR) Program in HIV/AIDS at CIHR was launched in November 2004. The program is managed by the Institute of Infection and Immunity in partnership with the Institute of Aboriginal Peoples' Health. The CBR Program funds capacity building initiatives and projects of research in two streams – Aboriginal research and General (non-Aboriginal) research.

The HIV/AIDS Community-Based Research Program funds meritorious research grants, development grants, capacity-building grants and training awards. The program promotes Canadian research and is guided by principles related primarily to collaboration, community participation and community control of the research agenda.

To ensure continuity and maintain the spirit with which the CBR program was developed, two distinct merit review panels were established, one for Aboriginal projects and another for general projects. These panels are composed of researchers and community members with expertise in CBR, knowledge of CIHR, experience with the Health Canada program and unique cultural perspectives. The panels met in early March to review the projects.



Biomedical/Clinical Research



Health Services/Population Health Research



Canadian HIV Trials Network



Community-Based Research Program

The Aboriginal panel received 19 proposals and the funding success rate was 41%. The General panel received 32 proposals and the funding success rate was 47%. The large number of applications received confirms the need for community-driven initiatives and the increasingly valuable role of community contributions.

The next Request for Applications in the CBR Program, with \$1,225,000 in available funds, was launched in June 2005.

#### HIV/AIDS Community-Based Research Program Aboriginal Stream

<b>Principal Investigator</b>	<b>Title</b>
<b>Mr. J. K. Barlow / Ms. Charlotte J. Loppie</b> Canadian Aboriginal AIDS Network	Canadian aboriginal cultural competence for HIV/AIDS health care providers
<b>Dr. Basanti B. Majumdar</b> McMaster University	Testing a model of HIV/AIDS prevention in Ontario first nations communities
<b>Mr. Randy Jackson</b> Canadian Aboriginal AIDS Network	HIV/AIDS community-based research program research technical assistants (Eastern Canada)
<b>Mr. Randy Jackson / Mr. J. K. Barlow</b> Canadian Aboriginal AIDS Network	HIV/AIDS community-based research program research technical assistant (Western Canada)
<b>Mr. Randy Jackson</b> Canadian Aboriginal AIDS Network	Qualitative data analysis: Aboriginal CBR capacity-building workshop
<b>Dr. Basanti B. Majumdar</b> McMaster University	Capacity building: Culturally sensitive training for staff and volunteers of first nations community organizations providing HIV/AIDS services
<b>Dr. Judith E. Mill</b> University of Alberta	Community solutions workshop: HIV testing and care for aboriginal youth

#### HIV/AIDS Community-Based Research Program General Stream

<b>Principal Investigator</b>	<b>Title</b>
<b>Dr. Carol A. Amaratunga</b> University of Ottawa	Global Ottawa AIDS link (goAI): Facilitating a learning community for innovative practice in HIV/AIDS prevention education in local ethnocultural and ethnoracial communities
<b>Mr. Michael Bailey</b> Canadian AIDS Treatment Information Exchange	Community-based research capacity-building workshops for AIDS service organizations across Canada to integrate a research component into the development and implementation of a national HIV peer treatment information project
<b>Dr. Françoise Côté / Dr. Mario Gagnon / Dr. Gaston Godin</b> Laval University	From intervention to "intravention": Making the transition towards a supportive culture within a Québécois IDU community
<b>Dr. Roma M. Harris / Dr. Irving Rootman</b> The University of Western Ontario	Rural HIV/AIDS information networks study
<b>Mr. Ross Harvey</b> British Columbia Persons With AIDS Society	Research technical assistant for the British Columbia community based research capacity building program
<b>Mr. Rick Kennedy</b> Ontario AIDS Network	Building bridges: Developing the community - based research capacity of HIV/AIDS communities in Ontario
<b>Dr. Lynne E. Leonard / Dr. Janet J. Rowe</b> University of Ottawa	Ontario women's study: "What Ontario women have to say about HIV prevention: Implications for policy and program development"
<b>Dr. Claude A. Olivier</b> The University of Western Ontario	Fostering social inclusion through small groups - development grant

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<b>Ms. Lyse Pineault</b> Coalition des organismes communautaires québécois de lutte contre le sida	Research technical assistant
<b>Dr. Stuart J. Rosser</b> Nine Circles Community Health Centre	Research technical assistant - general prairie region
<b>Ms. Ruthann Tucker / Ms. Saara Greene</b> Fife House	A prospective study to explore the impact of housing support and homelessness on the health outcomes of people living with HIV/AIDS in Ontario
<b>Dr. Mark W. Tyndall</b> BC Centre for Excellence in HIV/AIDS	MAKA initiative: HIV prevention and care among women survival sex workers
<b>Ms. Jennifer Vanderschaeghe</b> Alberta Community Council on HIV	The Alberta community council on HIV (ACCH) community-based research technical assistance (RTA) project

#### Priority Announcements - HIV/AIDS Research Program

As one of four federal partners under the Federal Initiative, the HIV/AIDS Research Program funds meritorious research grants and personnel awards across the entire spectrum of HIV/AIDS research. In keeping with the intent of the Federal Initiative, the HIV/AIDS research program promotes Canadian research, which provides the scientific base for the development of effective HIV/AIDS programs and policy.

#### Priority Announcements - HIV/AIDS Research Program Funding Decision - 2005

<b>Principal Investigator</b>	<b>Title</b>
<b>Dr. Paula Braitstein</b> Universitat Bern (Switzerland)	Hepatitis C co-infection among individuals initiating antiretroviral therapy in low income countries
<b>Dr. Julie Bruneau / Dr. Mark Daniel</b> Centre hospitalier de l'Université de Montréal (CHUM)	HIV and HCV transmission among injection drug users: Understanding the role of contextual and neighbourhood factors
<b>Dr. Shan Cen</b> Sir Mortimer B. Davis Jewish General Hospital	Study on the mechanism of human APOBEC3G encapsidation into HIV-1
<b>Dr. Eric A. Cohen</b> Institut de recherches cliniques de Montréal	Regulation of HIV-1 release and infectivity: Molecular and cellular analysis of HIV-1 Vpu functions
<b>Dr. Hélène Côté / Dr. Valentina C. Montessori</b> University of British Columbia BC Centre for Excellence in HIV/AIDS	Mitochondrial toxicity in HIV/HCV coinfection antiviral therapy
<b>Dr. Marie-Claude Couture</b> Université de Montréal	A study of two second-generation surveillance measures in connection with the prevalence of STIs and HIV, and of risk factors in sex-trade workers in three West African countries
<b>Dr. Prithwish De</b> McGill University	Network-mediated risk of HIV and hepatitis C transmission among injection drug users
<b>Dr. Karen M. Devries</b> London School of Hygiene and Tropical Medicine	Factors influencing condom use among aboriginal youth
<b>Dr. Shayesta Dhalla</b> University of British Columbia	Willingness of men who have sex with men (MSM) and injection drug users (IDUs), both HIV-ve and HIV+ve, to take part in a vaccine preparedness study (VPS) and a hypothetical vaccine study
<b>Dr. Keith R. Fowke</b> University of Manitoba	HIV resistance: A model of effective CD4+ T cell memory

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<b>Dr. Sonia Gauthier</b> Centre hospitalier de l'Université Laval	The intracellular itinerary of HIV-1 in human trophoblasts
<b>Dr. Jean N. Grotf</b> University of Alberta	The experiences of HIV-seropositive mothers living in rural Alberta
<b>Dr. Rabih Halwani</b> Centre hospitalier de l'Université de Montréal	Qualitative and quantitative parameters of correlates of protection in HIV-1 vaccines
<b>Dr. George E. Hatzakis</b> The Research Institute of the McGill University Health Centre	Improving HIV-treatment: Predicting HIV coreceptor CCR5 and CXCR4 usage through V3 genotype
<b>Dr. Kenneth H. Huang</b> McGill University	Study of immune correlates of viral control in HIV infection
<b>Dr. Michael Imbeault</b> Centre hospitalier de l'Université Laval	Determination of HIV-1 effects on CD4+ T lymphocytes : Discriminating between infected and bystander populations to achieve a better understanding of the mechanisms underlying AIDS
<b>Dr. Gareth J. Jones</b> University of Calgary	HIV-1 viral protein R and HIV-associated dementia: Molecular diversity, neurotoxicity and apoptosis
<b>Dr. Rupert Kaul</b> University of Toronto / University of Nairobi	The impact of herpes simplex 2 infection on genital tract immunology and HIV-1 transmission
<b>Dr. Sébastien F. Landry</b> Centre hospitalier de l'Université Laval	Characterization of antisense transcription in human immunodeficiency virus type 1
<b>Dr. Kathy Lévesque</b> Lady Davis Institute for Medical Research	Studies on the role of hnRNP A2 (heterogeneous nuclear ribonucleoprotein A2) in the viral replication of human immunodeficiency virus type 1 (HIV-1)
<b>Dr. Paul-André Lévesque</b> Université de Montréal	A comparative France-Québec analysis of developmental issues surrounding public health plans for combating HIV/AIDS in injected drug users (IDUs)
<b>Dr. Nicole Lund</b> University of Toronto	The role of globotriaosyl ceramide in HIV infection
<b>Dr. Geneviève Martin</b> Centre hospitalier de l'Université Laval	A study of the pathogenesis of infection with human immunodeficiency virus type 1 (HIV-1): Effects of the presence of CD40 and CD40 ligand (CD40L) molecules in the viral envelope on cells of the immune system
<b>Dr. Leah J. Martin</b> University of Alberta	The patterns of use and outcomes of highly active anti-retroviral therapy (HAART) among AIDS patients treated by the northern Alberta HIV program
<b>Dr. Sheila P. McCarthy</b> University of British Columbia	HIV and hepatitis C transmission networks in a cohort of injection drug users in Vancouver's downtown eastside: How structure and context matter
<b>Dr. Lyle R. McKinnon</b> University of Manitoba	The effect of HIV epitope variations on memory CD8 T cell responses
<b>Dr. Meredith L. McLaren</b> University of Toronto	Effects of sarn 68
<b>Dr. Simon Mercier</b> Centre hospitalier de l'Université Laval	A study of the interactions between galectins and human immunodeficiency virus type 1
<b>Dr. Simon Haile Merhu</b> University of British Columbia	Regulation of gene expression, genetic diversity, and host-responsiveness of toxoplasma gondii surface antigens
<b>Dr. Bradley L. Nilsson</b> University of California	Diversity-oriented synthesis of libraries of complex guanidines with novel anti-cancer and anti-HIV activity

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<b>Dr. Hendrik Poinar</b> McMaster University	Use of ancient DNA to study the origins and evolution of HIV: Implications of archival sequences in the design of more effective vaccines
<b>Dr. Martine Raymond</b> Institut de recherches cliniques de Montréal	Molecular mechanisms of antifungal drug resistance in <i>Candida albicans</i>
<b>Dr. Sachiko Sato</b> Centre hospitalier de l'Université Laval	Biochemical, cellular and molecular studies to dissect the contribution of the soluble host carbohydrate binding proteins to HIV-1 attachment and pathogenesis
<b>Dr. Marek J. Smieja</b> McMaster University	The Canadian HIV vascular study
<b>Dr. Hugo Soudeyns</b> Hôpital Sainte-Justine	Studies of host factors and HIV-1 determinants during pregnancy
<b>Dr. Sandra Thibault</b> Centre hospitalier de l'Université Laval	CD62L lectin involvement in HIV capture and its shift to trans, using endothelial cells collected from umbilical cords as experimental models
<b>Dr. Christos M. Tsoukas</b> McGill University Health Centre	Optimizing HIV therapy: The use of phiX174 in an Index cohort in predicting HIV specific T cell responses to therapeutic vaccines
<b>Dr. Guido Van Marle</b> University of Calgary	Infection of the gut by HIV-1
<b>Dr. Tania H. Watts</b> University of Toronto	Costimulation of human T cell responses

## Events in I & I

### Canadian Society of Allergy and Clinical Immunology Annual Scientific Meeting, Winnipeg, September 22-25, 2005

This meeting will include plenary sessions on Origins of Allergy in Early Life, Genetics, Ethics and Allergic Diseases, Diseases and much more. For further information, visit the Canadian Society of Allergy and Clinical Immunology website: [www.csaci.medical.org/annualmeeting.htm](http://www.csaci.medical.org/annualmeeting.htm)

### 12th International Symposium on Hepatitis C Virus and Related Viruses, Montreal, October 2-6, 2005

The HCV 2005 symposium will continue the tradition of providing an international forum for the exchange of new developments in research on a disease that affects 170 million people. The scientific program will focus on bridging the gap between basic and clinical research for the treatment of HCV infection. For further details, visit the symposium website: [www.hcv2005.com](http://www.hcv2005.com)

### Agriculture's Role in Managing Antimicrobial Resistance Conference, Toronto, October 23-26, 2005

This conference will feature national and international experts on various aspects of antimicrobial resistance in agriculture and will provide a forum to review where we are, and explore where we need to be in tackling antimicrobial resistance in Canada. For further details, visit the conference website: [www.omafra.gov.on.ca/english/livestock/animalcare/amr/facts/amrconference2005.htm](http://www.omafra.gov.on.ca/english/livestock/animalcare/amr/facts/amrconference2005.htm)

